INTRODUCTION

The Upper Colorado River Basin occupies 1,711,621 acres in Carbon and Sweetwater counties in south-central Wyoming, of which 1,504,775 acres are within the Rawlins Field Office. Land ownership consists of 73% federal lands, 22% private lands, and 5% state lands. Federal ownership includes 929,881 acres administered by the Bureau of Land Management and 165,029 acres administered by the United States Forest Service (Map #1).

Land ownership patterns vary from blocked public lands, checkerboard along the railroad right-of-way, to various mixtures of public and non-public lands ranging down to isolated 40-acre tracts of public lands. It is this intermingled ownership and dependency on the health of all lands that has resulted in cooperative efforts like the Muddy Creek Coordinated Resource Management (CRM) group. These efforts were initiated to improve individual allotment management and address watershed issues, which span multiple allotments, issues such as water quality, roads and erosion problems, and fisheries habitat. In 2001, one of the principal goals of the group was accomplished when Colorado River cutthroat trout were reintroduced into Littlefield Creek, an upper headwater tributary to Muddy Creek.

There have been many other successes throughout this watershed over the last fifteen years. Private individuals, livestock operators, non-profit groups, and agency personnel have all contributed to these efforts. In particular, though, the contributions of the Little Snake River Conservation District with support from the Natural Resources Conservation Service, need to be recognized. In project planning and implementation, monitoring, education, and cost-sharing, these groups and their employees have been a tremendous help in improving the resource conditions on public and private/state lands.

The 1996 rangeland reform process modified the grazing regulations to address the fundamentals of rangeland health. In August 1997, the *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the Bureau of Land Management in the State of Wyoming* were approved by the Wyoming State Director. The objectives of the rangeland health regulations are to "promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions… and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands." The fundamentals of rangeland health combine the basic precepts or physical function and biological health with elements of law relating to water quality and plant and animal populations and communities. Initially the standards focused on livestock grazing on BLM-administered lands, but the standards were developed to apply to all uses and resources.

In the Rawlins Field Office, rangeland standards were assessed on an allotment basis from 1998 through 2000. Some of the allotments contained within this watershed assessment were already evaluated, and that information and determination was just incorporated into this document. However, allotment assessments tend to emphasize management and impacts from livestock grazing, rather than on all uses which occur to and potentially impact public lands. In addition, assessing watersheds, water quality, and habitat for wildlife, fisheries, and threatened and endangered species, often does not correspond to allotment boundaries and is more logically evaluated at a larger scale. In January 2001, Instruction Memorandum No. 2001-079, Guidance for Conducting Watershed-Based Land Health Assessments, was sent to Field Offices from the Director of the BLM. This IM transmitted the 4180 Manual Section and 4180-1 Rangeland Health Standards Handbook and provides guidance for conducting assessments and evaluations for ascertaining rangeland health on a watershed basis. Under Policy/Action it states: "The Field Offices are to consider all assessment requirements for the watershed being assessed and select methods which will provide information needed to fulfill those requirements. When a field office invests its resources in an assessment, the end product should substantially meet all assessment needs to avoid conducting multiple assessments for multiple needs. For example, a well-planned, watershed-based assessment can provide the information needed for allotment evaluations, biological assessments for Section 7 Endangered Species Act consultation, and developing habitat management plans, Water Quality Improvement Plans for Total Maximum Daily Loads on impaired waters, and watershed restoration actions." In order to complete all

Standard Assessments within the original 10-year timeframe, watersheds have been divided into seven units with the upper Colorado River watershed report the first to be completed (see Map #2).

The standards are the basis for assessing and monitoring rangeland conditions and trend. The assessments evaluate the standards and are conducted by an interdisciplinary team with participation from permittees and other interested parties. Assessments are only conducted on BLM-administered public land, however, interpretation of watershed health and water quality may reflect on all land ownerships within the area of analysis. The six standards are as follows:

Standard 1- Watershed Health: *Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.*

> The standard is considered met if upland soil cover generally exceeds 30% and obvious signs of soil erosion are not apparent, and stream channels are stable and improving in morphology.

Standard 2 – Riparian/Wetland Health: *Riparian and wetland vegetation have structural, age, and species diversity characteristic of the state of channel succession and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for ground water recharge.*

> The standard is considered met if riparian/wetland habitat is rated in Proper Functioning Condition (PFC) and existing management will lead to maintaining or improving resource condtions.

Standard 3 – Upland Vegetation Health: *Upland vegetation on each ecological site consists of plant communities appropriate to the site, which are resilient, diverse, and able to recover from natural and human disturbance*.

> The standard is considered met if plant communities are sustaining themselves under existing conditions and management.

Standard 4 – Wildlife/Threatened and Endangered Species Habitat Health, Fisheries, Weeds: *Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.*

> The standard is considered met if habitat needed to support wildlife species is being sustained under existing conditions and management.

Standard 5 – Water Quality: *Water quality meets State standards.*

> The standard is considered unknown unless information provided by the State of Wyoming determines the status of a water body as impaired (not meeting) or is meeting its beneficial uses.

Standard 6 – Air Quality: *Air quality meets State standards*.

> The standard is considered met or impaired based on information provided by the State of Wyoming.

If an assessment shows that a standard(s) is not being met, factors contributing to the non-attainment are identified and management recommendations developed so the standard may be attained. If livestock are contributing to the nonattainment of a standard, as soon as practical but no later than the start of the next grazing season, management practices will be implemented to ensure that progress is being made toward

attainment of the standard(s). The rangeland standards established a threshold, however, the desired resource condition will usually be at a higher level than the threshold.

The desired range of conditions portrays the land or resource values that would exist in the future if management goals are achieved. The length of time to achieve the desired range of conditions would vary depending on the resources involved, the management actions required, and the speed at which different resources can effectively change. For instance, improving plant cover and litter, or changing species composition with treatments may be achieved relatively quickly in 5 to 10 years. However, developing a mixed age structure of willows along a stream by changing livestock management may take 20 to 30 years, even though proper functioning condition may already occur. Other actions, such as restoring aspen woodland within lodgepole pine forest communities using prescribed or natural fire, may take 50 years or more.

The following regulatory constraints or special management considerations govern some of the resource values in the area:

- Colorado River Salinity Compact
- Muddy Creek and Savery Creek Clean Water Act Section 319 Watershed Plans
- Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming. Conservation Plan for CRCT in the Little Snake River Drainage, Southeast Wyoming.
- Draft Conservation Agreement and Strategy for Three Cypriniform Fishes – Addressing Conservation needs for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker.
- Adobe Town Wilderness Study Area
- Adobe Town Wild Horse Herd Management Area
- Draft Yampa River Programmatic Biological Opinion – Endangered Fish of the Colorado River

The framework for this report will be an introduction and background information, followed by discussion of each rangeland standard in the order described earlier in this document. Within the discussion for each standard will be a map and description of how the standard will be addressed. The outline of discussion for each standard will follow the six-step process for ecosystem analysis at the watershed scale. The six steps are: 1) Characterization of the watershed, 2) Identification of issues and key questions, 3) Description of current conditions, 4) Description of reference conditions, 5) Synthesis and interpretation of information, and 6) Recommendations. Core topics will be discussed under the appropriate standard, with erosion processes, hydrology, and stream channels under Standard 1; vegetation split into wetland/riparian or upland under Standards 2 and 3; species and habitats under Standard 4; and water quality under Standard 5. Human uses would be discussed under each Standard where appropriate. Standard 1 – Watershed Health has been split into seven descriptions for different hydrologic units, while the Standards 2 through 6 are each described as one unit for the entire upper Colorado River watershed.

BACKGROUND

Topography of the basin consists primarily of gentle to moderately-sloping flats and rolling hills, with steep slopes limited to badlands, rims, and canyon walls along drainages. Key landscape features include Kinney Rim on the southwest border, Powder Rim along the Colorado state line, Delaney and Wamsutter Rims in the northwest border, Atlantic Rim on the northeast border, and the Browns Hill plateau, a high elevation bench which stretches 30 miles northward to Miller Hill, along the east side of the basin. Important drainages include the Little Snake River and its tributaries, including Savery Creek, Muddy Creek, and Sand Creek. Elevation ranges from around 6,000 ft along the Little Snake River to 8,400 ft on Miller Hill.

Climate varies greatly depending on the elevation and topography. Precipitation ranges from 7 to 9 inches in the lower desert regions to 10 to 14 inches in the foothills to over 20 inches in the Medicine Bow National Forest (MBNF). Wind plays a large role in blowing open exposed slopes and rims, while depositing snow in deep drifts on leeward slopes which support aspen communities and groundwater recharge for stream flows. The nearest National Weather Service station is at Baggs, where Muddy Creek

enters the Little Snake River. Mean annual moisture here is 12 inches, with April through June and September-October being the wettest months. Precipitation occurs as both snow during the winter and rain/thunderstorms during the spring and summer. Mean annual temperature at Baggs is 42 degrees Fahrenheit, with a mean winter temperature of 28 degrees and a mean summer temperature of 66 degrees.

Soils in the basin formed in residuum or alluvium derived dominantly from shales or sandstones. Layers of both these types are often found together in alternating bands of varying thickness. Textures run the gamut from clays to loams to sands and from very shallow to deep. Clay and silt-dominated soils are often saline or alkaline, while sandy and loamy soils have had enough precipitation to leach salts sufficiently to allow them to function (effective rooting depth) as moderate to deep soils. Fine-textured soils have lower infiltration rates and higher rates of runoff with high to severe potential for soil erosion, while loam to sandy soils have moderate to high rates of infiltration and produce low to moderate runoff with low to medium potential for soil erosion. Finer-textured soils will usually have lower amounts of vegetative cover and litter.

Vegetation is predominantly sagebrush-grass communities in this region, with nine species or subspecies of sagebrush shrubs commonly occurring together or in site-specific habitats. The next most common vegetation types are saline-influenced communities, either saltbush steppe or greasewood lowlands and playas. Utah juniper woodlands occur in the 10 to 14-inch precipitation zone where thin soils overlay a fractured bedrock substrate. Mountain shrubs, which include bitterbrush, snowberry, serviceberry, chokecherry, and mountain mahogany, occur in 10-inch or higher precipitation zones and are usually intermixed themselves or with sagebrush and juniper. Aspen woodland is usually found above 7,000 ft in small pockets on north and east-facing slopes where snow accumulates or there is some other source of additional moisture. Riparian and wetland habitats occur on less than one percent of public lands. Herbaceous and shrub-dominated riparian communities are the most common, with tree-dominated habitat such as cottonwood being the least common in occurrence.

Wildlife are abundant and diverse. Antelope, mule deer and elk are common big game species. Greater sage-grouse, Columbian sharp-tailed grouse, and mountain plover are important species of interest. Raptors include golden and bald eagles; ferruginous, red-tailed and Swainson's hawks; burrowing owls; and other hawks, harriers, and owls. Other commonly observed wildlife are coyotes, badger, beaver, muskrat, cottontail and jackrabbits, prairie dogs, ground squirrels, waterfowl, and songbirds. Fisheries are most recognized for various species of trout, which have all been introduced into streams and ponds for recreational use. Colorado River cutthroat trout historically occurred in this region and have recently been reintroduced into the upper Muddy Creek drainage and in the upper Little Snake River in the MBNF. Increasing attention is being directed at non-game fish species, including threatened and endangered species found lower in the Colorado River drainage and local native fishes such as the roundtail chub, bluehead sucker, and the flannelmouth sucker.

The Adobe Town Wild Horse Herd Management Area (HMA) straddles the boundary line between the Rawlins and Rock Springs Field Offices. The herd's appropriate management level (AML) is between 600 to 800 wild horses, with the current population at about 2,500 animals. The HMA is a vast, rugged land of sandy washes, rolling hills, juniper rims, and badlands, spread over 445,298 acres and having few fences. It only occupies the western one-third of this watershed assessment.

The Adobe Town Wilderness Study Area (WSA) is also within the same general area as the HMA just described. It consists of 10,920 acres near the center of the Washakie Basin. Adobe Town is bounded on the west by a broad, gently-sloping plain that is covered with stabilized sand dunes and alluvium. The flat terrain of this plain breaks abruptly at Adobe Town Rim into a maze of badlands that form small basins, ledges, and alcoves at lower elevations east of the rim. From a few hundred feet to several miles east of Adobe Town Rim, at still lower elevations, small isolated haystack buttes are located. These give Adobe Town its name and form the area known as Monument Valley.

Human population levels are low, with approximately 1,000 people living in the Little Snake River valley and just over 9,000 people living in Rawlins, the county seat, located about 20 miles north of the basin. Improved roads are limited to the paved state highways and dirt and graveled roads maintained by the

county, federal agencies, and, more recently, by mineral development companies. Human use on public lands within the Upper Colorado River Basin is generally related to oil and gas development, livestock grazing, and recreation.

Natural gas development is extensive in the northwest quarter of the basin and is expanding to the south and east, while oil fields occur in just a few small areas. Extensive, undeveloped coalfields have led to the recent exploratory development of coalbed methane on the east side of the Muddy Creek watershed between Rawlins and Baggs. Recent infield development of natural gas fields south of Wamsutter is reaching the density of one well per 80 acres, with lower density development ranging from one to four wells per 640 acres.

There are 104 allotments permitted for grazing use on public lands in the watershed analysis area. Grazing use is approximately 90 percent cattle and 10 percent sheep, with winter or seasonal use at lower elevations and only summer or fall use at higher elevations. Historical use in this area developed primarily as cattle until the harsh winter of 1886-87, which opened the door for sheep to dominate from the 1890s through the 1950s. Cattle numbers have slowly risen through the years, with most conversions to cattle happening in the 1960s through the 1980s. The Taylor Grazing Act in 1934 began a process of creating allotments, which has led to greater stewardship and on-the-ground management. Fencing of allotments has been an ongoing, long-term process, with pasture fencing becoming more common in recent times. Table #1 lists the allotment name, number, and the factors for each allotment, which were used to prioritize monitoring in the standards assessment, and corresponds to Map #3 depicting allotments within the watershed. This table was created using monitoring data, PFC assessments, and professional knowledge, as well as information or knowledge about these allotments from other agencies. Typically, the allotments with the most boxes checked will be the areas needing the most attention.

Recreation use includes hunting, fishing, camping, wildlife-viewing, ORV use, and traveling either the Continental Divide National Scenic Trail or the historic Overland Trail. The numbers of people involved in these activities are generally low except during the fall hunting seasons.